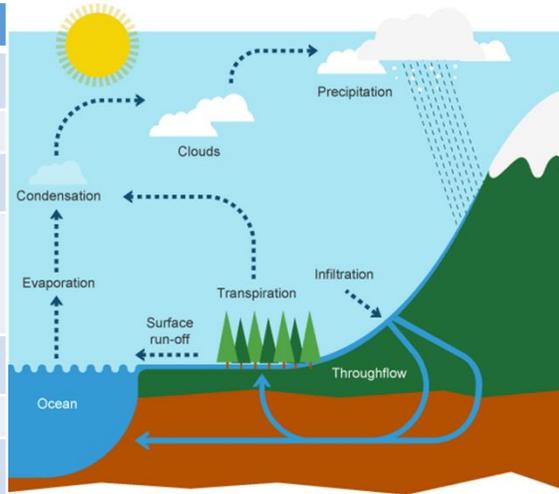


## The Water (Hydrological) Cycle

Ocean	A very large expanse of sea, in particular each of the main areas into which the sea is divided geographically.
Throughflow	flow of water within the soil layer
Infiltration	process by which water on the ground surface enters the soil.
Transpiration	Some water will evaporate from the surface of leaves or be taken up by the plant roots, and some of this water will eventually return to the air as vapour through the process of transpiration.
Surface run-off	the flow of water that occurs when excess storm water, meltwater, or other sources flows over the Earth's surface
Evaporation	when a liquid substance becomes a gas.
Clouds	a visible mass of condensed watery vapour floating in the atmosphere, typically high above the general level of the ground.
Condensation	water which collects as droplets on a cold surface when humid air is in contact with it.
Precipitation	rain, snow, sleet, or hail that falls to or condenses on the ground.

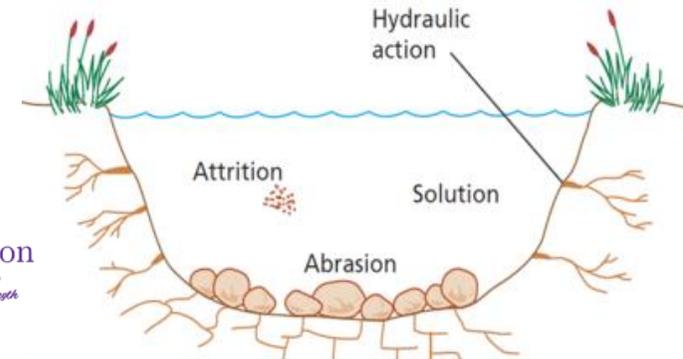


Longest River	Travels the furthest distance from source to mouth
Largest River	Carries the most amount of water

## Erosion

The break down and transport of rocks – smooth, round and sorted.

Attrition	Rocks that bash together to become smooth/smaller.
Solution	A chemical reaction that dissolved rocks.
Abrasion	Rocks hurled at the base of a cliff / river bank wearing it away. (sandpaper effect)
Hydraulic Action	Water enters cracks in the cliff, air compresses, causing the crack to expand.



# Year 8 Module 1 Rivers



## Course of a River



## Upper Course of a River

Near the source, the river flows over steep gradient from the hill/mountains. This gives the river a lot of energy, so it will erode the riverbed vertically to form narrow valleys.

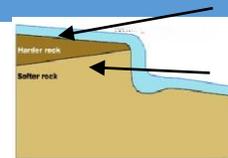
## Middle Course of a River

Here the gradient gets gentler, so the water has less energy and moves more slowly. The river will begin to erode laterally making the river wider.

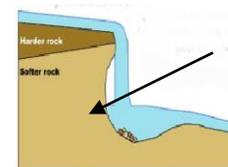
## Lower Course of a River

Near the river's mouth, the river widens further and becomes flatter. Material transported is deposited.

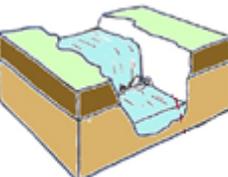
## Formation of a Waterfall (Upper Course landform)



1) River flows over alternative types of rocks.



2) River erodes soft rock faster creating a step.



3) Further hydraulic action and abrasion form a plunge pool beneath.

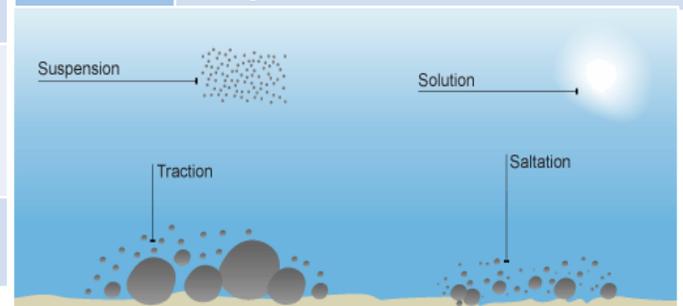
4) Hard rock above is undercut leaving cap rock which collapses providing more material for erosion.

5) Waterfall retreats leaving steep sided gorge.

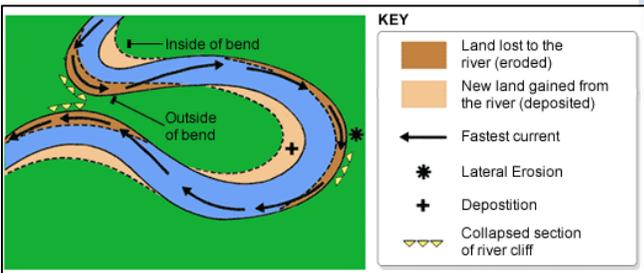
## Transportation

A natural process by which eroded material is carried/transported.

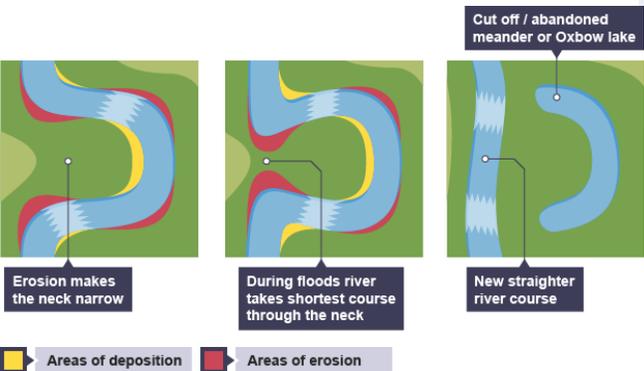
Solution	Minerals dissolve in water and are carried along.
Suspension	Sediment is carried along in the flow of the water.
Saltation	Pebbles that bounce along the sea/river bed.
Traction	Boulders that roll along a river/sea bed by the force of the flowing water.



## Formation of Meanders and Ox-bow Lakes (Middle Course landform)



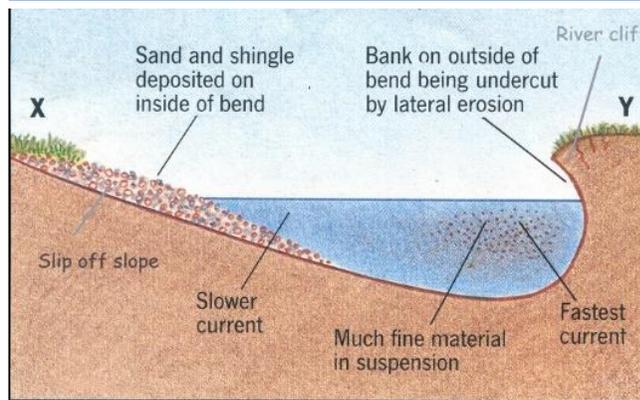
Step 1	Step 2
Erosion of outer bank forms river cliff. Deposition inner bank forms slip off slope.	Further hydraulic action and abrasion of outer banks, neck gets smaller.



Step 3	Step 4
Erosion breaks through neck, so river takes the fastest route, redirecting flow	Evaporation and deposition cuts off main channel leaving an oxbow lake.



## Cross Section of a meander (slip-off slopes and River Cliffs)



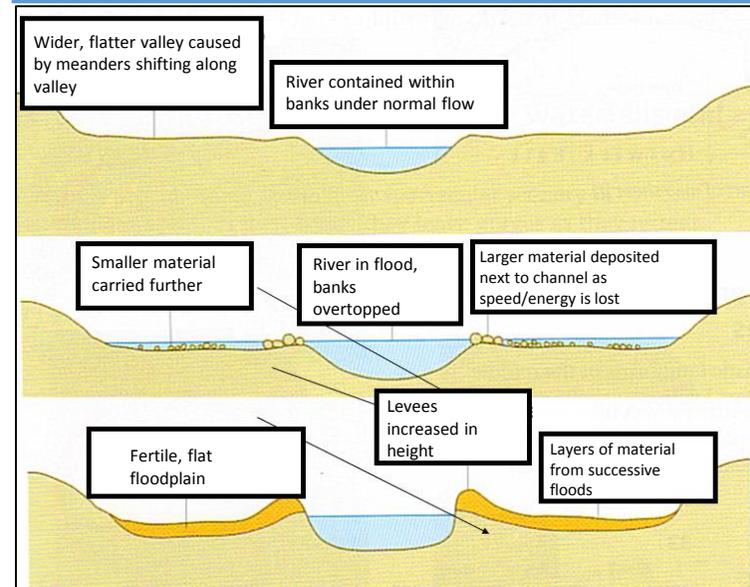
A **river cliff** will be found on the outside bend of a meander. This is because the water is faster and the channel is deeper meaning that erosion will take place

A **slip-off slope** is found on the inside of a meander. This is because the water is slower and the channel is shallower meaning that deposition will take place.

## River Management Schemes

Soft Engineering	Hard Engineering
<p><b>Afforestation</b> – plant trees to soak up rainwater, reduces flood risk.</p> <p><b>Demountable Flood Barriers</b> put in place when warning raised.</p> <p><b>Managed Flooding</b> – naturally let areas flood, protect settlements.</p>	<p><b>Straightening Channel</b> – increases velocity to remove flood water.</p> <p><b>Artificial Levees</b> – heightens river so flood water is contained.</p> <p><b>Deepening or widening river</b> to increase capacity for a flood.</p>

## Formation of Floodplains and levees (Lower Course landform)



## Causes of Flooding

Physical	Human
<p><b>Precipitation:</b> rain, snow, sleet, hail. More rainfall will increase the water in the rivers. Also increase rainfall can lead to saturated soils, which will increase surface run-off.</p> <p><b>Geology:</b> means type of rock. Some rocks are permeable so water flows through, others are impermeable so water will collect on the surface.</p> <p><b>Relief:</b> means the shape of the land. Steeper gradients will lead to increased surface-runoff, so water reaches the river faster.</p>	<p><b>Urbanisation:</b> building cities leads to more tarmac surfaces which is impermeable. This causes increased surface run-off and water reaching the river faster.</p> <p><b>Agriculture:</b> means farming. Land is often ploughed which leaves furrows, water can flow quickly through furrows reaching rivers faster.</p> <p><b>Deforestation:</b> cutting trees down. When trees are removed, water is not taken up by the roots which can lead to more water reaching the river.</p>

## Impacts of Flooding

Positive	Negative
Flooding deposits fine silt onto the floodplain making it fertile and excellent for agriculture	Thousands of homes damaged by flooding each year, which can leave people temporarily homeless
Floods are important for regenerating habitats such as wet lands	Bridges can be destroyed and roads closed
Floods recharge and replenish ground water	Approximately 6 million properties in the UK are exposed to some level of flood risk
55% of people living in flood risk areas know the risk and 60% of those people have taken action to prepare for flooding.	Billion of pounds worth of insurance claims are paid out each year for businesses and households damaged by flooding